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TRAVIS AIR FORCE BASE**

**TRAVIS AIR FORCE BASE
INSTRUCTION**



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Weather

WEATHER SUPPORT INSTRUCTION

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This instruction implements AFI 10-206, Operational Reporting, AFI 10-2501, Air Force Emergency Management (EM) Program, AFI 11-208 IP, Department of Defense Notice to Airmen (NOTAM) System, AFI 15-114, Functional Resource and Weather Technical Performance Evaluation, AFI 15-128, Air Force Weather Roles and Responsibilities, AFMAN 10-2504, Air Force Incident Management Guidance for Major Accidents and Natural Disasters, AFMAN 15-111, Surface Weather Observations, AFMAN 15-124, Meteorological Codes, AFMAN 15-129V1, Air and Space Weather Operations - Characterization, AFMAN 15-129V2, Air and Space Weather Operations - Exploitation, Air Mobility Command Instruction (AMCI) 15-101, Weather Operations and Support, and reinforces Air Force Policy Directive 15-1, Weather Operations. It establishes responsibilities, weather support procedures and provides general information for weather services, including weather observations and forecasts, weather warnings, watches, and advisories (WWA); space weather data, information dissemination, and base-wide reciprocal support. It applies to units assigned to the 60th Air Mobility Wing (60 AMW) and units assigned, attached, or supported by Travis Air Force Base (AFB). This instruction applies to the 349th Air Mobility Wing (349 AMW) (AFRC), the 621st Contingency Response Wing (621 CRW), and the Navy VQ-3 Detachment. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) AFMAN 33-363, Management of Records, and disposed of IAW the Air Force Records Information System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/gcss-af61a/afirms/afirms/>. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847,

Recommendation for Change of Publication; route AF Forms 847 from the field through the appropriate functional's chain of command.

SUMMARY OF CHANGES

This document has been substantially revised and needs to be completely reviewed. Major changes include: revision of category A and B visibility specification and amendment criteria; addition of Observed Weather Advisories for thunderstorms within 10 nautical miles and 25 nautical miles of Travis AFB; addition of the Travis AFB Installation Data Page link; addition of tower visibility procedures to Chapter 2 and Attachment 3; deletes Chapter 10 and relocates content to Chapter 5; deletes **Chapter 12**, 7 and 5 and relocates content to Chapter 4; deletes Chapter 6 and relocates content to Chapter 3; relocates Chapter 4 content to Chapter 3; deletes Chapter 8 and 9 and relocates content to Chapter 2; relocates Chapter 3 to Chapter 2; mission limiting thresholds from Chapter 2 are developed into **Attachment 6**; relocates **Attachment 6** into **Figure 2.1** diagram; replaces **Attachment 9** Travis AFB Meteorological Equipment Locations with Local Operations Extended Outlook.

Chapter 1— CHARACTERIZATION UNIT (CU) & EXPLOITATION UNIT (EU)	
INTERACTIONS	5
1.1. General.....	5
1.2. Concept of Operations.	5
1.3. Responsibilities.....	5
Table 1.1. 60 OSS/OSW Duty Priority Listing.....	6
1.4. Hours of Operation.	7
1.5. Contact Information.....	7
1.6. Business Continuity Rules.	7
Chapter 2— AIRFIELD SUPPORT	10
2.1. General.....	10
2.2. Observations.	10
Table 2.1. Mandatory Supplementary Weather Conditions.....	11
2.3. Terminal Aerodrome Forecasts (TAFs).....	12
2.4. RP Products.....	12
Table 2.2. Weather Watches	12
Table 2.3. Weather Warnings	13
Table 2.4. Forecast Weather Advisory.....	14

Table 2.5.	Observed Weather Advisories.	14
2.5.	Dissemination Process.	15
Table 2.6.	Notification Priority.	15
Figure 2.1.	Weather Pyramid Alerting	16
2.6.	Cooperative Weather Watch (CWW).	16
2.7.	PMSV Support.	17
2.8.	Emergency Action(s) Response.	17
Table 2.7.	Conditions Requiring SWAP Activation	18
Chapter 3—	MISSION SERVICES	19
3.1.	General.	19
3.2.	Flying Missions.	19
3.3.	MWP.	19
3.4.	MISSIONWATCH.	20
3.5.	Post-Mission Analysis/Feedback.	20
3.6.	Transient Aircrew Support.	20
3.7.	Aero Club Activities.	21
3.8.	Non-Flying Missions.	21
3.9.	Space Weather Impacts.	21
Chapter 4—	STAFF SERVICES	22
4.1.	General.	22
4.2.	Staff Meteorological Functions.	22
4.3.	Staff Integration Functions.	22
4.4.	Reciprocal Support.	23
Chapter 5—	WEATHER EQUIPMENT	27
5.1.	General.	27
5.2.	Meteorological Sensing.	27
5.3.	Communications Equipment.	27
5.4.	Maintenance.	27
Table 5.1.	Equipment Maintenance List.	28

Table 5.2.	Equipment Restoral Priorities.....	28
5.5.	Building Power.	28
Attachment 1—	GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION	29
Attachment 2—	SPECIAL WEATHER OBSERVATION CRITERIA	33
Attachment 3—	FORECAST SPECIFICATION AND AMENDMENT CRITERIA	36
Attachment 4—	SAMPLE WEATHER PRODUCT DISSEMINATION FORMAT/INTERPRETATION OBSERVATION/TAF/WWAS	38
Attachment 5—	CUSTOMER RESPONSE MATRIX	43
Attachment 6—	FLYING UNITS SUPPORTED & MISSION LIMITING ENVIRONMENTAL CONDITIONS	45
Attachment 7—	MISSION EXECUTION FORECAST EXAMPLE	47
Attachment 8—	SITUATIONAL AWARENESS SHEET EXAMPLE	48
Attachment 9—	LOCAL OPERATIONS EXTENDED OUTLOOK EXAMPLE	49
Attachment 10—	TRAVIS AFB METEOROLOGICAL EQUIPMENT LOCATIONS	50

Chapter 1

CHARACTERIZATION UNIT (CU) & EXPLOITATION UNIT (EU) INTERACTIONS

1.1. General. The 25th Operational Weather Squadron (25 OWS), the 618th Air Operations Center (Tanker Airlift Control Center) Weather Directorate, (618 AOC (TACC)/XOW), and the 60th Operations Support Squadron Weather Flight (60 OSS/OSW) are the official weather information agencies for Travis AFB. These agencies provide weather information in support of 60 AMW, 349 AMW, 621 CRW, Navy VQ-3 Detachment and subordinate units and units assigned, attached, or supported by Travis AFB. The 618 AOC (TACC)/XOW is commonly referred to as TACC/XOW throughout this document. The 60 OSS/OSW is commonly referred to as the Weather Flight (WF) and is the focal point for all weather-related issues. This instruction is reviewed and revised no greater than biennially or IAW with host/parent unit procedures if the time is less than biennially.

1.1.1. The 25 OWS is considered the characterization unit (CU). Characterization encompasses the “collect, analyze and predict” weather core competencies. Characterization depends on Air Force Weather’s ability to collect accurate data, correctly analyze that data, and use the results to produce a coherent picture of the present and future state of the air and space environment.

1.1.2. WF and TACC/XOW are considered exploitation units (EU). Exploitation is the ability to minimize the impact of environmental threats to friendly forces while simultaneously capitalizing on environmental conditions that maximize the operational advantage over enemy forces. Exploitation units tailor the characterization provided by the characterization unit. Tailoring is the extraction of data that is pertinent to a specific mission profile from the overall characterization of the air and space environment. Tailoring does not mean changing the characterization. To the greatest extent possible, exploitation units utilize the characterized data provided to them.

1.2. Concept of Operations. The 25 OWS at Davis Monthan AFB, Arizona, provides regional and operational-level weather products and information to Air Force and Army units in the western region of the Continental United States (CONUS).

1.2.1. Meteorological Watch (METWATCH). The 25 OWS performs a continuous METWATCH for Travis AFB. METWATCH is a deliberate, continuous process for monitoring terrestrial weather or the space environment in an area or region. The purpose of a METWATCH is to identify when and where observed conditions significantly diverge from forecast conditions, determine courses of action to update or amend a forecast product or group of products, and notify designated agencies.

1.2.2. The WF and TACC/XOW are the primary source of tailored weather services in support of the 60 AMW, the 349 AMW, the 621 CRW, various headquarters elements, and visiting aircrews. The WF and TACC/XOW make every effort to ensure that mission-limiting weather is anticipated and exploited, and that safety and Resource Protection (RP) are maintained.

1.3. Responsibilities. General responsibilities of the 25 OWS and WF are outlined in AFI 15-128, **para. 4.1** and **para. 6.2** respectively.

1.3.1. The 25 OWS issues the Travis AFB Terminal Aerodrome Forecasts (TAFs), forecast weather Watches, Warnings, and Advisories (WWAs), and may provide flight weather briefings to transient aircrews passing through Travis AFB. Additionally, the OWS issues observed WWAs in the event the airfield is closed or the WF is unable.

1.3.2. The WF issues all observed WWAs when the airfield is open.

1.3.3. The WF creates Mission Weather Products (MWP) that fuse theater scale products with local mission requirements to enable the direct inject of weather impacts into warfighter planning and/or execution. Upon request, the WF provides flight weather briefings and operational weather support for the 60 AMW and 349 AMW. The WF also provides flight weather briefings for the Navy VQ-3 Detachment and transient aircrews IAW the WF duty priorities listed in [Table 1.1](#)

1.3.4. TACC/XOW. TACC/XOW provides flight weather briefings and operational weather support for the 60 AMW and the 349 AMW primarily through the Global Decision Support System (GDSS).

1.3.5. Travis AFB Installation Data Page. The 25 OWS and Travis AFB WF coordinate on and maintain the Travis AFB Installation Data Page. Data page details include: TAF specification and amendment criteria, WWA thresholds, desired lead times, mission impacts, unit information, Joint Environmental Toolkit (JET) back-up contacts and local outage back-up information. The data page is located at: https://ows.dm.af.mil/ows_unique/25data/moa/Travis_AFB_Data_Page.pdf.

1.3.6. Eyes Forward & Collaboration. The Travis AFB WF acts as the eyes forward for the 25 OWS by relaying significant, time-sensitive meteorological information not found in coded meteorological reports to the assist in forecast operations.

1.3.7. Duty Priorities. All WF tasks cannot be accomplished simultaneously. Therefore, IAW AFMAN 15-129V2 the WF has established the duty priorities listed in [Table 1.1](#) based on their order of relative importance to mission accomplishment. Since not all situations affecting operations at Travis AFB can be anticipated, WF personnel should use sound risk management principles to determine the need to recall additional personnel to assist in meeting surges in operations.

Table 1.1. 60 OSS/OSW Duty Priority Listing

Priority	Duties
1	Perform WF Emergency War Order (EWO) Taskings
2	Execute WF Evacuation
3	Respond to Aircraft/Ground Emergencies
4	Respond To Pilot-to-Metro Service (PMSV) Contacts
5	Prepare and Disseminate Weather Watches, Warnings, and Advisories (WWAs)
6	Disseminate Urgent Pilot Reports (PIREPs) Locally, to 25 OWS, and Longline
7	Disseminate all PIREPs Locally, to 25 OWS (as required), and Longline
8	Severe Weather Action Plan (SWAP) Operations

9	Augment Automated Meteorological Observing System (AMOS) Observations for Mandatory Elements and/or Transmit Surface Weather Observations
10	Provide “Eyes Forward” / Collaborate with 25 OWS
11	Mission Execution Forecast Process – Produce and Disseminate Forecasts
12	Perform MISSIONWATCH activities
13	Provide Weather Briefings
14	Weather Functional Training
15	Accomplish Administrative Tasks

1.4. Hours of Operation.

1.4.1. WF. The WF remains open 24 hours a day, 7 days a week, in concurrence with airfield operating hours. In the event of airfield closure, the WF may close to match airfield hours. Staff services are primary available Monday through Friday during standard duty hours, but are accommodated to the maximum extent possible as required or upon request.

1.4.1.1. In the event of an airfield/WF closure, the WF technician is responsible for contacting the 25 OWS, Air Traffic Control (ATC), base operations, and respective command posts (CPs). The weather technician does not leave the work center until all agencies have been notified.

1.4.1.2. During any WF closure, flight leadership will designate personnel to remain on “standby” status. Contact information for the standby forecaster is included below.

1.4.2. 25 OWS and TACC/XOW. Hours of operation are 24/7, 365 days a year.

1.4.3. A web-based aircrew-briefing terminal is located in the base operations flight planning room. This briefing terminal allows aircrews to self-brief or schedule a flight weather briefing from the 25 OWS.

1.5. Contact Information.

1.5.1. WF (707) 424-3003/5549 / DSN 837-3003/5549

1.5.2. WF Alternate Operating Location (707) 424-3003/2975/2110 / DSN 837-3003/2975/2110

1.5.3. Standby Forecaster Cell Phone (707) 639-7579

1.5.4. PMSV 271.1 MHz

1.5.5. TACC/XOW (618) 229-0353 / DSN 779-0353

1.5.6. 25 OWS (520) 228-6673 / DSN 228-6673

1.6. Business Continuity Rules. Support to the installation and flying operations is susceptible to equipment and communication outages at the 25 OWS, TACC/XOW, and WF. The WF participates in various Wing, 25 OWS, and AMC exercises to maintain procedures for and proficiency at tasks necessary to ensure continuity of support.

1.6.1. WF Business Continuity Rules. In the event of a building evacuation, the WF relocates to their Alternate Operating Location (AOL) with contact numbers listed in **para.**

1.5.2 WF members utilize evacuation checklists and standard operating procedures (SOPs) to expedite resumption of installation weather support. If access to observing sensing equipment readouts is lost, manual equipment is used to take observations. Expect some services to be degraded (weather products, pilot briefings, etc.) due to facility limitations (i.e. decreased number of computers) and the possibility of loss of dedicated data services such as the FMQ-19 sensors; however, meteorological satellite (METSAT) and radar imagery are readily available.

1.6.2. 25 OWS Business Continuity Rules. For short-term disruptions in 25 OWS support (up to 72 hours), the WF assumes local TAF and WWA responsibility. For long-term disruptions in 25 OWS support (greater than 72 hours), the 25 OWS re-establishes support from an alternate location.

1.6.3. TACC/XOW Business Continuity Rules. IAW AMCI 15-101, if the TACC/XOW loses the capability to provide flight weather briefing services, the WF assumes responsibility for all Travis AFB Integrated Flight Management (IFM) and non-IFM weather packages. If the WF is unable to provide the required support, briefing responsibility is transferred to the 25 OWS.

1.6.4. Weather Exercises. AMC weather units typically conduct coordinated exercises on the second Wednesday/Thursday of each month. As a courtesy, the WF coordinates timelines and potential impacts with supported units prior to all scheduled exercises. AMC/A3AW issues Special Instructions (SPINS) outlining the functions and capabilities to be exercised during manual/tactical observing exercises. Global Decision Support System (GDSS) and TACC outage exercises are managed by the TACC/IG. General Wing, Aircrew, WF, and 618 AOC responsibilities and exercise schedules are outlined in the 618 AOC/XOW Backup Exercises CONOPS.

1.6.4.1. GDSS/TACC Outage Exercises. GDSS/TACC outage exercises ensure the WF is proficient in utilizing GDSS to assist in supporting operations during TACC evacuations, operational surges beyond TACC/XOW's capability to support, or GDSS outages. During GDSS/TACC outage exercises, the WF:

1.6.4.1.1. Provides mission weather packages through GDSS, DD Form 175-1, verbal briefings or Mission Weather Product (MWP). A backup MWP product has been created and integrated into the daily situational weather worksheet. The MWP is divided into two parts: the local MWP (which borrows en-route sections from the DD Form 175-1, along with more detailed takeoff/landing sections), and Part II (refueling/mission areas).

1.6.4.1.2. Ensures all briefing packages are completed and available to the aircrews NLT 4 hours prior to scheduled departure—if no requested brief time is received by aircrew.

1.6.4.2. Manual/Tactical Observing Exercise. Manual/tactical observing exercises ensure the WF is proficient in the use of tactical weather systems and manual observing methods needed to continue the dissemination of accurate weather observations during partial or total failure of the installation's automated observing system. Additionally, these exercises provide the opportunity to conduct required operations checks of deployable

weather equipment and ensure WF personnel are proficient in its operation. During manual/tactical observing exercises the WF:

1.6.4.2.1. Follows AMC/A3AW published SPINS. These SPINS contain the specifics for the each exercise.

1.6.4.2.2. Ensures all personnel are certified on the manual/tactical observing.

1.6.4.3. AOL Exercise. AOL exercises fulfill the AFMAN 15-129V2 requirements for WF leadership to ensure all personnel are task certified to operate at the AOL and meet annual exercise requirements. Prior to the exercise, WF leadership must ensure that the AOL has a view of the airfield complex and that adequate communications are available.

Chapter 2

AIRFIELD SUPPORT

2.1. General. Airfield support includes those actions affecting the Travis AFB aerodrome (defined within a 5NM radius of the airfield) or Travis AFB as a whole. These functions include, but may not be limited to, weather observing, meteorological watch, and resource protection.

2.2. Observations. Travis AFB utilizes the FMQ-19 AMOS working in concert with JET to evaluate, prepare, and transmit weather observations. IAW AFMAN 15-111, automated systems at Department of Defense controlled airfields are to operate in full-automated mode except under the conditions specified in **para. 2.2.7.2** and **2.2.7.4**. The three basic types of observations provided are METAR, SPECI, and LOCAL.

2.2.1. Aviation Routine Weather Report (METAR). METAR is a routine scheduled observation disseminated locally and long-line between 55 and 59 minutes after the hour. METAR contains a complete report of wind, visibility, runway visual range, present weather and obstructions, sky condition, temperature, dew point, and altimeter setting. In addition, a METAR may contain encoded and/or plain language information that elaborates on data in the report.

2.2.2. Aviation Selected Special Weather Report (SPECI). SPECI is an unscheduled observation completed and transmitted when any of the Travis AFB special criteria listed in **Attachment 2**, Special Weather Observation Criteria, are observed or sensed. SPECI contains all data elements found in a METAR plus additional remarks that elaborate on data in the body of the report. A SPECI is prepared and transmitted as soon as possible after the relevant criteria are observed. **Attachment 4** contains an example SPECI weather observation.

2.2.3. Aviation Selected Local Weather Report (LOCAL). LOCAL is an unscheduled observation, not meeting SPECI criteria. When performing FMQ-19 backup the WF takes a single element LOCAL for altimeter setting, at an interval not to exceed 35 minutes, when there has been a change of one or more altimeter settings since the last reported altimeter value.

2.2.4. Point Of Observation. The official point where a weather observation is taken. On Travis AFB, the point of observation is where the FMQ-19 sensors are located (see **Attachment 10** for sensor group locations). During periods of augmentation from the primary site, the point of observation is marked by a compass on the roof of building P-4. When augmentation is required from the AOL, the official observation point is marked by a compass rose approximately 45 ft from the AOL flight line exit door.

2.2.5. Observing Location Limitations.

2.2.5.1. The FMQ-19 is properly sited and no limitations are currently noted.

2.2.5.2. When augmenting observations at the primary site (Bldg P-4), obstructions in the north to northeast and southwest to west may impact derived prevailing visibility. Air Traffic Control (ATC) personnel supplement surface observations when required as identified in **para. 2.6** of this instruction.

2.2.5.3. When augmenting observations at the AOL, obstructions to the northeast and west through northwest may impact derived prevailing visibility. Additionally, observers may not hear thunder due to the level of noise on the flight line.

2.2.6. Automated FMQ-19 Observation. An automated observation is any observation evaluated, prepared, and transmitted by an observing system without human intervention. When operating in automated mode, the FMQ-19 determines sky condition based on an evaluation of sensor data gathered during the 30-minute period ending at the actual time of the observation. All other evaluated elements are based on sensor data that is within 10 minutes or less of the actual time of the observation.

2.2.7. FMQ-19 Augmentation. Augmentation is a method of having a position-qualified weather technician manually add or edit data to an observation generated by the FMQ-19. The two augmentation processes used are supplementing and backup.

2.2.7.1. Supplementing. Supplementing is the process of manually adding meteorological information to an observation generated by the FMQ-19 that is beyond the system's capability to detect and/or report. For example, the sensor cannot detect tornadoes or hail.

2.2.7.2. Supplementing procedures. WF personnel supplement observations when the airfield is open and the weather conditions in [Table 2.1](#) are observed or are forecast to occur within 1 hour. Additionally, WF personnel are required to log on to an AMOS and be prepared to supplement whenever a tornado watch is valid or a warning has been issued for tornadic activity.

Table 2.1. Mandatory Supplementary Weather Conditions

Mandatory Supplementary Weather Conditions – Body of Report
Tornado (+FC) (Note 1)
Funnel Cloud (FC) (Note 1)
Waterspout (+FC) (Note 1)
Hail (GR) (local warning criteria only)
Volcanic Ash (VA)
Ice Pellets (PL)
Mandatory Supplementary Weather Conditions – Remarks Section of Report
Funnel Cloud (Tornadic Activity_B/E(hh)mm_LOC/DIR_(MOV)) (Note 2)Snow Depth (Note 2)(only during airfield operating hours)
Tower Visibility (Note 3)
Notes:1. The immediate reporting of funnel clouds takes precedence over any other phenomenon.2. Remarks and Additive Data references are provided in AFMAN 15-111, Attachment 3 . 3. Whenever tower visibility is reported by ATC personnel, and either surface visibility or tower visibility is less than 4SM and differs by at least one reportable value.

2.2.7.3. Backup. Backup is a method of manually providing meteorological data and/or dissemination of an FMQ-19 generated observation when the primary automated method is not operational or unavailable due to sensor and/or communication failure.

2.2.7.4. Backup procedures. In the event of FMQ-19 malfunction or failure, back-up procedures are implemented during airfield operating hours and/or if tornadic activity is occurring or forecast to occur. WF personnel use manual observing procedures when performing back-up operations. When required, the WF encodes and disseminates METAR and SPECI observations IAW AFMAN 15-111. All element entries are observed within 15 minutes of the actual time of the observation with the exception of wind gusts and squalls, which are reported only if they are observed within 10 minutes of the time of the observation. When utilizing a properly sited TMQ-53 as back-up equipment at a controlled airfield, wind values are estimated. When utilizing any other form of back-up equipment, both wind and pressure values are estimated.

2.3. Terminal Aerodrome Forecasts (TAFs). Travis AFB TAFs are produced and disseminated by the 25 OWS IAW AFI 15-128, AFMAN 15-124, AFMAN 15-129V1, and the Travis AFB Installation Data Page. TAFs are valid for 30 hours, apply to the area within 5NM of the Travis AFB airfield complex, and are issued at 0300, 1100, and 1900 Zulu time. [Attachment 3](#) lists forecast specification and amendment criteria. [Attachment 4](#) contains an example of a typical Travis AFB TAF.

2.4. RP Products. Special Weather Statements (SWS) and weather WWAs are special notices used to alert decision makers of hazardous weather occurring or the potential for hazardous weather to occur within the area of operations. Customer responses to WWAs are listed in [Attachment 5](#).

2.4.1. SWS. A notice issued by the 25 OWS to assist with resource and RP decisions. SWS advise of the potential for widespread hazardous weather conditions in a specified geographical region. The WF utilizes the SWS to assist in maintaining situational awareness of environmental conditions that have the potential to negatively impact Travis AFB or the local flying area.

2.4.2. Weather Watch. A special notice to notify installation personnel and supported units of a potential for environmental conditions of such intensity as to pose a hazard to life or property. Watches are issued for the criterion defined in [Table 2.2](#) and are valid for a 5NM radius from the center of the Travis AFB runway complex.

2.4.2.1. Watches are standalone products based upon potential and are unaffected by warnings or advisories for the same phenomena.

2.4.2.2. Multiple watches may be in effect at the same time.

Table 2.2. Weather Watches

Watch Type	Criteria	Desired Lead Time
Tornado	Within 5NM	As potential warrants
Severe Thunderstorms	Winds \geq 50 Knots or Hail \geq 3/4 Inch	As potential warrants
Damaging Winds	\geq 50 Knots	As potential warrants

Freezing Precipitation	Any Intensity	As potential warrants
Large Hail	Hail $\geq 1/2$ but $< 3/4$ inch	As potential warrants
Heavy Rain	≥ 2 Inch Accumulation in ≤ 12 Hours	As potential warrants
Lightning	Within 5NM	30 Minutes

2.4.3. Weather Warning. A special notice to inform installation personnel when an established weather condition of such intensity as to pose a hazard to life or property is occurring or is expected to occur. Warnings are issued for the criterion defined in [Table 2.3](#) and are valid for a 5NM radius from the center of the Travis AFB runway complex.

2.4.3.1. Only one warning can be in effect at a time. When multiple warning criteria are forecast to occur, a single warning containing all applicable criteria is issued. A separate valid time may be specified for each criterion as necessary. Exception: tornado and lightning warnings are issued separately from other warnings.

2.4.3.2. Warnings provide concise information outlining environmental threats. If a warning is issued for one weather criterion and it becomes necessary to warn for another weather criterion, a new warning, with a new number, is issued.

2.4.3.3. Forecast warnings take precedence over advisories for the same phenomenon and should maintain horizontal consistency with TAFs and other forecasts products.

Table 2.3. Weather Warnings

Warning Type	Criteria	Desired Lead Time
Tornado	Expected or Occurring Within 5NM	30 Minutes
Severe Thunderstorms	Winds ≥ 50 Knots or Hail $\geq 3/4$ Inch	1 Hour
Moderate Thunderstorms	Winds ≥ 35 but < 50 knots or Hail $\geq 1/2$ inch but $< 3/4$ inch	1 Hour
Damaging Winds	≥ 50 Knots	2 Hours
Strong Winds	≥ 35 Knots but < 50 Knots	1 ½ Hours
Freezing Precipitation	Any Intensity	1 Hour
Heavy Rain	≥ 2 Inch Accumulation in ≤ 12 Hours	1 Hour
Lightning	Within 5NM	Observed

2.4.4. Observed Weather Warnings. Lightning warnings are the only observed warning issued for Travis AFB. Lightning warnings are issued when lightning is observed within 5NM, either visually or via the National Lightning Detection Network. Lightning warnings are cancelled when lightning has not been observed within the past 15 minutes and radar indicates thunderstorms are no longer occurring within 5NM.

2.4.5. Weather Advisories. A notice to inform end users when an established environmental condition affecting operations is occurring or is expected to occur at Travis AFB. Forecast weather advisory criteria are defined in [Table 2.4](#) and observed weather advisory criteria are defined in [Table 2.5](#).

Table 2.4. Forecast Weather Advisory

Criteria	Forecast/Observed
Surface Winds \geq 25 Knots but $<$ 35 Knots	30 Minutes

Table 2.5. Observed Weather Advisories.

Criteria	Forecast/Observed
Low-Level Wind Shear	Observed
Crosswinds \geq 31 kts with wet or dry runway (Note 1)	Observed
Crosswinds \geq 27 kts with wet or dry runway (Note 1)	Observed
Crosswinds \geq 19 kts with wet runway (Note 1)	Observed
Crosswinds \geq 12 kts with wet runway (Note 1)	Observed
Moderate or greater Icing below 10,000ft AGL	Observed
Moderate or greater Turbulence below 10,000ft AGL	Observed
Lightning within 25NM of Travis AFB	Observed
Lightning within 10NM of Travis AFB	Observed
Notes:	
1. Crosswinds are calculated based on the maximum observed wind speed (to include gusts) and worst-case observed direction, including variability.	

2.4.6. WWA Numbering Scheme. WWAs are numbered consecutively by identifying the type of weather message (watch, warning, or advisory) followed by a five-digit number. The first two numbers indicate the current month while the second three numbers indicate the sequence number. For example, the message “Weather Warning 02-005” means the month is February (02) and this is the fifth (005) warning issued in the month. The message “Weather Advisory 12-013” means the month is December (12) and this is the thirteenth (013) advisory issued in the month. An example of an observed weather advisory is contained in **Attachment 4**.

2.4.7. WWA Upgrades/Downgrades. An upgrade is a change to an active WWA resulting from adding additional WWA phenomenon or an increase in phenomenon intensity that crosses to a higher threshold (e.g., winds increase from 35 knots to 50 knots). A downgrade is a change to an active WWA resulting from removing WWA phenomenon or a decrease in phenomenon intensity that crosses to a lower threshold (e.g., hail decreases from $\frac{3}{4}$ inch to $\frac{1}{4}$ inch).

2.4.8. WWA Amendments. Amendments are issued when an active WWA no longer adequately describes a phenomenon’s expected occurrence. All amendments are issued with a new WWA number and should clearly state what affect the new WWA has on any previously issued notices.

2.4.9. WWA Extensions. Extensions are issued when a phenomenon’s occurrence is expected to last longer than originally forecast. Extensions are issued prior to the expiration of the original WWA utilizing the same WWA number. Extensions should clearly state what effect they have on any previously issued notices.

2.4.10. WWA Cancellation. WWA are canceled when the weather phenomena is no longer occurring or expected to occur. WWA not extended or canceled automatically expire at the end of the valid period. Observed advisories are canceled when the criteria has not occurred in the last 30 minutes. See **para. 2.4.4** for cancellation of observed lightning warnings.

2.5. Dissemination Process.

2.5.1. Observations. Observations taken by either the FMQ-19 or the weather technician are disseminated via JET. When JET is nonoperational, the WF relays observations to the following local organizations in order of priority listed in **Table 2.6**.

Table 2.6. Notification Priority.

1. Tower commercial (707) 424-4694
2. RAPCON (707) 424-5111
3. 60 AMW/CP commercial (707) 424-5517
4. Airfield Management commercial (707) 424-2836
5. 25 OWS commercial (520) 228-7655

2.5.2. TAFs. 25 OWS disseminates TAFs via JET. If JET is nonoperational, the WF disseminates the TAF to ATC and 60 AMW/CP via telephone, fax, or e-mail.

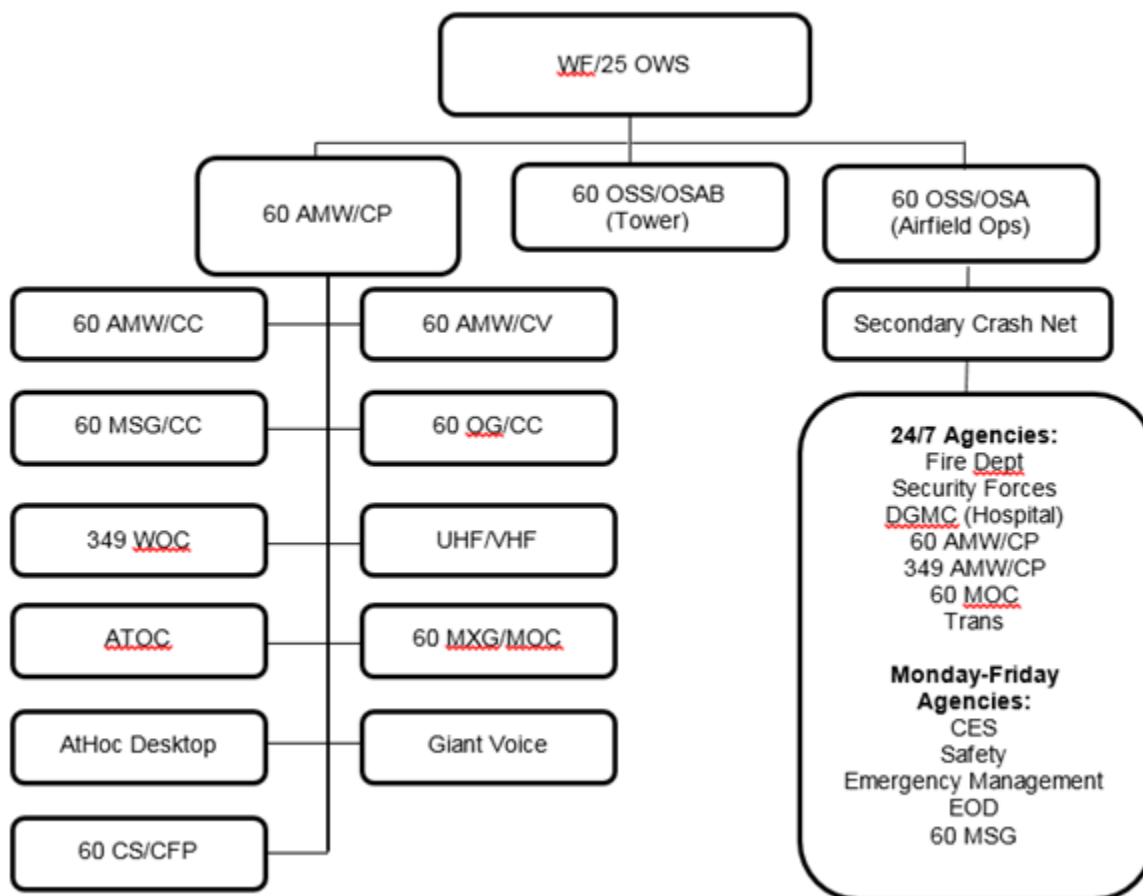
2.5.3. SWSs. 25 OWS transmits SWSs to WF leadership via e-mail. WF leadership forwards SWSs to 60 AMW leadership.

2.5.4. WWAs. The 25 OWS or the WF enters WWAs into JET for dissemination to ATC, 60 AMW/CP, and 60 OSS/OSA Airfield Management. If JET is out-of-service, the 25 OWS or the WF disseminates WWAs via back-up calls. Upon notification, units identified in **Figure 2.1** should further disseminate *all* WWAs using the pyramid notification scheme. In addition, the 60 AMW/CP disseminates all WWAs via e-mail and/or AtHoc.

2.5.4.1. Lightning Warnings. All lightning warnings are disseminated by the 60 AMW/CP to the base populace via the Giant Voice system.

2.5.4.2. Tornado Warnings. The 60 AMW/CP has the primary responsibility for sounding the base siren for a tornado warning issuance. In the event the CP system is malfunctioning, the 60 OSS/OSA sounds the siren.

Figure 2.1. Weather Pyramid Alerting



2.6. Cooperative Weather Watch (CWW). The WF and ATC have established a CWW IAW **AFMAN 15-111**. The agreement outlines each unit's responsibilities when specific meteorological phenomena are observed. Of primary concern is the report of tower visibility differing from the prevailing surface visibility, local PIREPs, and any occurrence of previously unreported weather conditions that could affect flight safety or be critical to the safety or efficiency of other local operations and resources. WF technicians and ATC personnel should thoroughly understand and be able to execute the CWW agreement. Specifically:

2.6.1. Travis AFB Tower personnel:

2.6.1.1. Notify the weather technician when the observed tower prevailing visibility decreases to less than or increases to equal or exceed 1, 2, 3, or 4 miles, and is different than the surface prevailing visibility.

2.6.1.2. Notify the weather technician whenever there are operationally significant changes to tower prevailing visibility and the tower visibility is different than the reported surface prevailing visibility.

2.6.1.3. Notify the weather technician when PIREPs are received of previously unreported weather conditions that could affect flight safety or be critical to the safety

and efficiency of other local operations and resources. PIREP information should be relayed to weather personnel no later than 5 minutes after receipt.

2.6.1.4. Notify the weather technician when tower personnel detect significant weather phenomena (i.e., lightning, precipitation, low ceilings, etc.) and the phenomena is not reflected in the current surface weather observation.

2.6.2. Travis AFB weather technicians:

2.6.2.1. Re-evaluate the surface weather observation when tower personnel report significant weather phenomena not reflected in the current observation.

2.6.2.2. Re-evaluate the surface prevailing visibility, as soon as practicable, upon notification that the control tower prevailing visibility is different than the surface prevailing visibility and either the surface visibility or tower visibility is less than 4 miles. Note: Tower visibility is included in remarks when received (reference [Table 2.1](#)).

2.6.2.2.1. Use control tower values of prevailing visibility as a guide in determining the surface visibility when the view of portions of the horizon is obstructed by buildings, aircraft, etc.

2.6.2.2.2. Include a tower visibility remark in the next METAR or SPECI when either the surface prevailing visibility or the control tower prevailing visibility is less than 4 statute miles (6000 meters) and they differ by one or more reportable values.

2.6.3. ATC Limited Observation Training. WF oversees the Travis AFB Limited Observation Training Program. ATC personnel requiring training should contact WF leadership at DSN 837-7090/Commercial (707) 424-7090 to schedule an appointment. To satisfy Limited Observation Training requirements, personnel are required to pass a written exam and receive an orientation of the weather facilities.

2.7. PMSV Support. Weather information is available via PMSV on frequency 271.1 MHz. The duty forecaster monitors PMSV traffic for all aircraft contacts. For aircraft outside the range of our PMSV system, the Travis AFB WF or 25 OWS can provide PMSV support through a phone patch to the 60 AMW/CP (DSN 837-5517/Commercial (707) 424-5517). PMSV outages are discussed in **para. 5.3.2**.

2.8. Emergency Action(s) Response.

2.8.1. Aircraft Mishap. When notified of an aircraft mishap, the WF initiates a save of applicable data used in the development of any weather products provided. Archived weather data is available to investigating agencies upon request.

2.8.1.1. If the WF provided the MWP, the WF notifies the 25 OWS Senior Duty Officer of all aircraft mishaps as soon as possible after notification of the event. The WF coordinates with the 25 OWS to save all applicable data and products. If products from other OWSs were used, the WF coordinates with all applicable OWSs to ensure the correct data is saved. OWSs save sufficient data to fully reconstruct environmental conditions before and after the mishap.

2.8.1.2. If an OWS, TACC/XOW, or another WF provided the MWP, they are responsible for conducting the data save in coordination with any other Air Force Weather units involved.

2.8.2. SWAP. The SWAP ensures sufficient manpower is available to meet the increased demand for timely weather information during significant weather events. The WF duty forecaster initiates the SWAP when any of the criteria in [Table 2.7](#) are forecast to occur.

Table 2.7. Conditions Requiring SWAP Activation

SWAP ACTIVATION Criteria
Watch/Warning for Tornado(s)
Watch/Warning for Severe Thunderstorms w/Hail $\geq 3/4$ Inch
Watch/Warning for Damaging Winds ≥ 50 kts
Watch/Warning for Heavy Rain ≥ 2 Inches in 12 hrs
Watch/Warning for Freezing Precipitation

2.8.3. Chemical, Biological, Radiological, Nuclear, and High-yield Explosive (CBRNE) Response. The WF works closely with Emergency Management (EM) to ensure supported commanders receive the relevant information needed to obtain a timely and accurate picture of the environmental situation. Upon request, the WF provides EM:

2.8.3.1. Surface observations and/or alphanumeric forecasts representative of the location and time of the CBRNE event.

2.8.3.2. The appropriate Chemical Downwind Messages obtained from the 25 OWS.

Chapter 3

MISSION SERVICES

3.1. General. The WF, 25 OWS, and TACC/XOW support the Travis AFB flying and non-flying missions. This chapter focuses on routine products and services provided to aviation units.

3.2. Flying Missions. The WF and the TACC/XOW provide weather support to the flying units listed in [Attachment 6](#). The bulk of flying operations at Travis AFB are supported by the TACC/XOW.

3.3. MWP. MWPs fuse theater scale products with local mission requirements enabling the direct inject of weather impacts into warfighter planning and/or execution. The result is a product designed to provide timely, accurate, and relevant environmental information for planning and execution. MWPs must be horizontally consistent with (but not necessarily mirror) products issued by any OWS and the 557th Weather Wing (557 WW).

3.3.1. GDSS Weather Briefings. GDSS is the primary command and control (C2) system used by AMC owned/gained flying units to obtain weather briefings. GDSS provides a unique product that incorporates the requirements of all Travis AFB-based flying units into a common format. Updates can be obtained by calling TACC/XOW at DSN 576-0353/Commercial (618) 229-0353, or by contacting the WF at DSN 837-3003/Commercial (707) 424-3003.

3.3.2. WF MWP. The WF MWP is used to provide standardized weather briefings to non-AMC owned/gained flying units that are briefed by the WF. In the event of a GDSS outage, the WF may also use the WF MWP when executing TACC Business Continuity Rules. An example WF MWP is in [Attachment 7](#).

3.3.3. Verbal MWP. Aircrews flying local missions may request a verbal briefing if no significant weather concerns are forecasted for their mission time. The information is recorded on the verbal briefing log maintained in the WF.

3.3.3.1. The Travis AFB Situational Awareness Sheet. The Situational Awareness Sheet serves as the Takeoff and Landing Data (TOLD) product for pilots. TOLD provides a forecast of expected conditions over at Travis AFB for a 12-hour period, divided into hourly increments. It includes local area TAFs, solar/lunar data, airfield hazards, climb winds, and mission limiting thresholds for 8 other divert airfields. [Attachment 8](#) provides an example of the Situational Awareness Sheet.

3.3.3.2. The Situational Awareness Weather Sheet is updated NLT 0400 and 1600 daily. The morning data sheet is e-mailed to all requesting agencies/commanders. The Travis AFB Weather SA product is posted at: <https://eim.amc.af.mil/org/60oss/weather/default.aspx>.

3.3.3.3. Local Operations Extended Outlook. The Local Extended Outlook is created once daily after 1500L Monday-Friday and is for informational purposes only. It contains expected weather conditions 48 hours out for Travis AFB and flight hazards within the most commonly used AR tracks and Low Level Routes used by Travis AFBs local training sorties. [Attachment 9](#) provides an example of the Extended Outlook Product

that is uploaded daily to the Weather SharePoint site: <https://eim.amc.af.mil/org/60oss/weather/default.aspx>.

3.4. MISSIONWATCH. MISSIONWATCH is a deliberate process for monitoring terrestrial weather or the space environment for specific mission-limiting, environmental factors that may adversely impact missions in execution. The MISSIONWATCH process is intended to identify previously unidentified environmental threats and alert decision-makers at the operational unit and/or airborne mission commanders, enabling dynamic changes to mission profiles that may mitigate the environmental threat and optimize the chance of mission success.

3.4.1. WF Briefed Sorties. The WF utilizes a continuous MISSIONWATCH process to validate that MWP accurately reflect environmental conditions. When MWPs differ from observed conditions to the extent that it has the potential to impact operations, the WF coordinates MWP amendments/updates with the appropriate OWS. Additionally, when previously unforecast weather conditions expose a mission to potential risk, the WF directly updates the 60 AMW/CP. The 60 AMW/CP retains responsibility for relaying updated weather information to the aircrew.

3.4.2. TACC/XOW Briefed Sorties. TACC/XOW performs MISSIONWATCH and weather risk assessment for all TACC briefed sorties. TACC uses the Weather Threat Assessment (WTA) to relay information on missions considered “at risk” based on the Operational Risk Management Thresholds identified in AMCI15-101. Users can access the WTA at <https://tacc.scott.af.mil/?action=WTAMain>.

3.4.2.1. The 60 AMW/CP automatically receives WTA notifications for wing-specific missions through a subscription service. Upon receipt of weather threat notification, the AMW/CP notifies appropriate Squadron Operations Centers/aircrews to pass along weather threats and instruct the aircrew to contact TACC/XOW to mitigate the threat.

3.4.2.2. The WF monitors GDSS for situational awareness on TACC/XOW briefed missions involving 60 AMW and 349 AMW assets. The WF coordinates with TACC/XOW whenever observed weather conditions deviate significantly from the published WTA.

3.5. Post-Mission Analysis/Feedback. Aircrews should contact TACC/XOW or the WF with post-mission information and/or follow-up support. TACC/XOW and the WF utilize customer feedback to improve internal processes and enhance training, forecast proficiency, and product accuracy. Formal/informal feedback methods include:

3.5.1. Completion of WF feedback worksheet or TACC/XOW feedback solicitation email.

3.5.2. Phone call or an e-mail to TACC/XOW or the WF.

3.5.3. Face-to-face feedback after briefing and/or mission completion.

3.6. Transient Aircrew Support. Weather technicians provide or arrange for weather support for transient aircrews IAW the duty priorities listed in **Table 1.1**. The WF may provide flight weather briefings (Form 175-1s), and/or updates to aircrews or may arrange for weather support from the 25 OWS briefing cell when higher duty priorities take precedence. The 25 OWS briefing cell can be reached at DSN 228-6598/6599, commercial (520) 228-6598/6599, or via web access from the aircrew briefing terminal located in the flight planning room. This method is located at: <https://owsjet2.dm.af.mil/portal/private/JET/createMission?portal>.

3.7. Aero Club Activities. The WF provides flight weather briefings to Aero Club members performing official Air Force operational duties (i.e. Civil Air Patrol and Initial Flying Training Programs). The WF provides or arranges briefings when such Aero Club flights are in a transient status through the appropriate OWS or Flight Service Station. The WF advises Aero Club members performing official flight duties of the OWS web page request process and self-briefing capabilities.

3.8. Non-Flying Missions. The WF and 25 OWS support various non-flying missions (e.g., Wg Picnic, change of command ceremonies, Morale Welfare and Recreation) through RP (WWAs). Specific support to non-flying missions is identified in **Chapter 4**.

3.9. Space Weather Impacts. Travis AFB has a wide-variety of operations affected by various space-weather parameters (High Frequency and Ultra High Frequency communication, radar, Global Positioning System communications, etc.). The WF and TACC/XOW provide space impacts on their MWP. More detailed space environmental situational awareness products are available at

<https://weather.af.mil/confluence/display/AFWWEBSTBT/CONUS+Regional+Space+Weather>.

Chapter 4

STAFF SERVICES

4.1. General. Staff services are typically accomplished by WF leadership and include meteorological functions (briefings), ensuring the WF is trained and equipped for day-to-day operations, and cultivating relationships with base agencies to ensure WF support is optimal.

4.2. Staff Meteorological Functions. Staff meteorological functions aid leadership in identifying and understanding specific weather and environmental impacts. Specialized weather information can be provided to support any non-flying mission upon request. The WF is available to assist commanders in determining weather support requirements and impacts to operations. Non-governmental agencies should request weather information and support through 60 AMW/PA. Examples of staff meteorological functions provided are:

4.2.1. 60AMW Staff Briefings. Staff weather briefings for 60 AMW (Wing stand up) are provided as required. Standard information includes a 5-day Travis AFB weather outlook with a focus on any affected Wing events. Additional information is provided as it pertains to operations and safety, or at the request of OSS, OG, or AMW leadership.

4.2.2. Installation Control Center (ICC)/Crisis Action Team (CAT) Briefings. The WF provides weather support as required for ICC/CAT briefings. This includes real-world emergency, exercise, and deployment briefings. Each briefing is tailored to provide the appropriate weather intelligence required by the 60 AMW and 349 AMW leadership.

4.2.3. Instrument Refresher Course (IRC) Briefings. IAW AFMAN 11-210, *Instrument Refresher Course (IRC) Program*, computer based training is available for the weather portion of the briefing. If requested, the WF can provide a briefer to discuss more detailed local weather effects and impacts. This briefing includes airfield and mission services, WF capabilities, resource protection, seasonal/regional weather and space weather impacts (when applicable).

4.2.4. Pre-deployment Planning Briefings. The WF provides pre-deployment weather briefings as requested. Briefing content is tailored to meet customer requirements. For example, an aviation unit receives weather impacts at the deployed location on their flying mission, in addition to the standard surface weather information usually presented to ground units. A ground-based unit may receive a briefing on surface temperatures, wind speed, potential for blowing sand and dust, precipitation and pertinent environmental factors.

4.2.5. Climatology Services. The WF can provide a wide variety of climatology products upon request. Example products include, but are not limited to, historical surface observations, long-range outlooks, global cloud cover, and upper level wind climatology.

4.3. Staff Integration Functions. In addition to leadership and management of unit activities, these unit members also function as a direct interface with the supported unit commander and staff, and provide direct support to command, control and planning functions. Specific procedures/functions for integration with base agencies are outlined below.

4.3.1. 60 AMW/XP and 349 AMW/XP (Plans and Programs). The WF assists in periodic exercises tailored to upcoming seasonal weather or other environmental concerns and educates base agencies on the purpose and applicability of WWAs.

4.3.2. 60 AMW/CP and 349 AMW/CP. The WF notifies the CPs whenever the WF primary facility is evacuated and/or the AOL is activated.

4.3.3. 60 AMW/PA. The WF provides tours of the WF facility for community groups and others when coordinated by Public Affairs.

4.3.4. 60 OSS/OSAA (Airfield Management). The OWS or WF provides notification of all WWAs via JET, telephone, e-mail, or in-person.

4.3.4.1. The WF notifies OSAA whenever the WF primary facility is evacuated and/or the AOL is activated.

4.3.4.2. WF leadership participates as a member of the Airfield Operations Board (AOB) as directed in AFI 13-204 Vol III, *Airfield Operations Procedures and Programs*.

4.3.5. 60 OSS/OSAB (Air Traffic Control).

4.3.5.1. The WF provides notification of all WWAs via JET/telephone/or e-mail.

4.3.5.2. The WF notifies OSAB whenever the WF primary facility is evacuated and/or the AOL is activated.

4.3.5.3. The WF notifies OSAB of all outages prior to contacting any maintenance agency.

4.3.6. 60 CES. The WF provides a monthly climatology report, accessible via the WF SharePoint page.

4.3.7. All Supported Flying Units (60 AMW, 349 AMW, and Navy VQ-3 Detachment). The WF provides services as outlined throughout this publication.

4.4. Reciprocal Support.

4.4.1. 60 AMW and 349 AMW CPs.

4.4.1.1. Ensure dissemination of all WWA as outlined in [Chapter 2](#) of this document.

4.4.1.2. Immediately notify the WF forecaster-on-duty of any aircraft or ground mishaps (weather-related or not) requiring OPREP-3 reporting or local reporting requirements IAW AFI 10-206.

4.4.1.3. Subscribe to and monitor the WTA notifications for 60 AMW and 349 AMW missions.

4.4.1.4. Upon notification, by either the WF or 25 OWS, of the potential for severe weather, utilize applicable Quick Reaction Checklists (QRCs) to alert wing leadership and various base agencies.

4.4.2. 60 AMW/CP. Activate base emergency sirens when a WARNING for tornadoes is issued. Disseminate all warnings via email and/or AtHoc.

4.4.3. 60 AMW/PA. Coordinate requests for weather information from non-DoD agencies and tours of WF facilities with the WF chief.

4.4.4. 60 OSS/OSAA.

4.4.4.1. Notify WF personnel of in-flight, ground emergencies, or mishaps and termination via the secondary crash network.

4.4.4.2. Activate base emergency sirens when a WARNING for tornadoes is issued and the 60 AMW/CP does not have the capability to activate the sirens.

4.4.4.3. Disseminate weather warnings and advisories as outlined in **Chapter 2** of this instruction.

4.4.4.4. Notify WF of runway surface condition changes, as this impacts crosswind thresholds.

4.4.4.5. Take appropriate Notice to Airman (NOTAM) action when notified by the WF of changes in the operational status of weather equipment or evacuation of the WF to the alternate operating location lasting over 24 hours.

4.4.4.6. Submit WF updates to flight publications when required.

4.4.5. 60 OSS/OSAB.

4.4.5.1. Participate in and follow the procedures outlined in CWW program.

4.4.5.2. Notify the WF of all changes in active runway.

4.4.5.3. Notify the WF of any light setting changes on the high-intensity runway lights.

4.4.5.4. Relay pilot weather reports to weather personnel within 5 minutes of receipt.

4.4.5.5. Provide control tower orientation training for weather personnel.

4.4.5.6. Initiate/respond to radio checks to ensure proper PMSV operation.

4.4.5.7. Monitor Travis PMSV frequency (UHF 271.1. MHz) during WF outages, in accordance with established duty priorities.

4.4.6. 60 OSS/OSAM (Airfield Systems).

4.4.6.1. Provide, coordinate, or arrange for the installation, maintenance, and repair of all weather communication and meteorological sensing equipment except for the communication and meteorological equipment maintained by contract.

4.4.6.2. Coordinate with the weather technician prior to performing maintenance on weather communications or equipment. Ensure routine maintenance does not degrade METWATCH and/or MISSIONWATCH performed by the WF during periods of inclement weather.

4.4.6.3. Utilize the restoration priorities for weather communications and meteorological sensing equipment outlined in this document.

4.4.6.4. Notify the responsible service agents for weather communications and meteorological sensing equipment outages.

4.4.6.5. Perform necessary follow-up actions as required until full service is restored.

4.4.6.6. Ensure weather data and telephone circuits are assigned repair priorities.

4.4.6.7. Ensure established maintenance response times are met.

4.4.6.8. Ensure a 24-hour point of contact for reporting outages and assigning job control numbers is available.

4.4.6.9. Perform AN/TMQ-53 Tactical Meteorological Observing System pressure sensor calibrations annually, or when comparisons between the tactical pressure sensor and aircraft altimeter (or similar reliable sensors) indicate that calibration is warranted.

4.4.7. 60 CS.

4.4.7.1. Maintain and administer JET IAW the memorandum of agreement between 24 AF, AF Director of Weather, and the JET Program Management Office.

4.4.7.2. Coordinate with off-base agencies to repair off base lines.

4.4.7.3. Ensure weather data and telephone circuits are assigned repair priorities.

4.4.7.4. Perform necessary follow-up actions as required until full service is restored.

4.4.7.5. Ensure a 24-hour point of contact for reporting outages and assigning job control numbers is available.

4.4.8. 60 CS/SCOT. Provide or arrange for maintenance and repair of the PMSV radio system.

4.4.9. 60 AMW/SE. Request a Travis AFB WF briefer for seasonal weather briefings and provide 2 weeks advance notice when possible.

4.4.10. 60 CES. Contact WF Leadership to request climatological data and specialized support for projects on Travis AFB.

4.4.11. 60 SFS. Promptly inform the WF of any hazardous weather reported by Security Forces personnel (e.g., tornado, hail, etc.).

4.4.12. All Supported Flying Units (60 AMW, 349 AMW, and Navy VQ-3 Detachment).

4.4.12.1. Notify the WF of current and planned weather alternates and any special considerations affecting duration of mission (i.e., weather categories, exercise/deployment considerations, etc.).

4.4.12.2. Notify the WF of required additional support as soon as it becomes known, to include monitoring of alternate observations/forecast and tracking of weather conditions affecting local flying operations.

4.4.12.3. Provide timely notification of changes to scheduled operations affecting weather support requirements as soon as the change is identified.

4.4.12.4. Provide PIREPS either directly to the WF or through the PMSV, tower, or Supervisor of Flying (SOF).

4.4.12.5. Provide feedback on all weather briefings via e-mail or survey to the WF or TACC/XOW.

4.4.12.6. Provide the WF a minimum of 2 weeks advanced notification of any requirement for training conducted by the WF or any changes in requirements to previously scheduled weather training.

4.4.13. Base Operations Flight Information Publication (FLIP) Manager. Submit FLIP updates provided by the WF to Air Force Flight Standards Agency/Operating Location-D (AFFSA)/OL-D.

4.4.14. 621st Contingency Response Wing (CRW). The ranking CRW weather forecaster serves as the point of contact for all weather related CRW activities, and should:

4.4.14.1. Collaborate with WF for tactical weather equipment proficiency training at least 2 weeks in advance.

4.4.14.2. Provide back-up briefing support to WF Staff Services function during periods of limited manning (exercises, deployments).

4.4.15. 60 AMDS/SGPB (Bioenvironmental Flight). Provide the base populace with the Wet Bulb Globe Temperature (WBGT) as required.

4.4.16. All Weather Support Recipients. All recipients should notify the WF when new weather support requirements are identified or when changes to current weather support is deemed necessary.

Chapter 5

WEATHER EQUIPMENT

5.1. General. This chapter provides a brief description of the meteorological and communications equipment used by the WF. Additionally, it provides information on backup systems, maintenance, and restoring priorities.

5.2. Meteorological Sensing. The WF uses the FMQ-19 and WSR-88D weather radar to determine the current state of the atmosphere. These critical systems provide customers the most timely, accurate, and relevant weather intelligence possible. **Note:** TMQ-53 is a tactical automated observing system that is used by the WF during contingency and exercise operations. The TMQ-53 provides a capability that is very similar to the FMQ-19.

5.2.1. FMQ-19. The FMQ-19 samples, measures, and reports: temperature, wind speed and direction, visibility, cloud base height and amount of coverage, pressure, liquid equivalent precipitation accumulation, and ice accretion during freezing precipitation. These measurements are processed to create properly formatted, fully automated observations that comply with applicable reporting standards and protocols defined by the World Meteorological Organization (WMO), Federal Aviation Administration (FAA), National Weather Service (NWS), and military reporting standards.

5.2.2. Gibson Ridge Software (GRS). The WF utilizes the GRS applications to access WSR-88D, Weather Surveillance Radar (i.e., NEXRAD) data. This software allows technicians to observe a large variety of both meteorological and non-meteorological phenomena ranging from sunrise spikes to detailed information on complex thunderstorm circulations. Weather technicians routinely incorporate the latest radar information into all mission execution forecasts and RP products.

5.3. Communications Equipment. The following systems are the backbone of the WF communications network:

5.3.1. JET. As discussed in **para. 2.5** of this instruction, JET is the primary system for disseminating forecast, observations, and WWAs. Telephones are used as a backup for key aircraft controlling agencies.

5.3.2. PMSV Radio. The PMSV Radio (271.1 MHz) allows the WF to communicate with aircrews, both on the ground and in the air. When the Travis AFB PMSV is out-of-service, aircrews can contact TACC/XOW at (618) 229-0353 / DSN 779-0353 or the 25 OWS at (520) 228-6598/6599 / DSN 228-6598/6599 to acquire weather information. Aircrews may also obtain weather information via phone patch from the WF, TACC/XOW, or the 25 OWS.

5.3.3. Phones/Hotlines. Phones and hotlines serve primarily for rapidly passing along critical, time-sensitive information, as well as to serve backup services.

5.3.4. Local Area Network (LAN). The WF relies heavily on the LAN to improve the timeliness and accuracy of weather intelligence to our customers.

5.4. Maintenance.

5.4.1. Organizations providing preventive maintenance and repair of weather and communications equipment are listed in **Table 5.1**

Table 5.1. Equipment Maintenance List.

Organization	Equipment
60 OSS/OSAM (Airfield Systems)	FMQ-19
557 WW Fielded Systems	JET
60 CS/SCOV (Telephone Systems)	Phones/Hotlines
60 CS/SCOI (Network Maintenance)	LAN/Internet Connectivity

5.4.2. Restoral Priorities. Priorities for restoring critical systems exist in the event of natural disasters or any other anomaly, simultaneously impacting systems base-wide. Significant indicates a situation where the equipment is completely inoperative, while minimal means the equipment is in limited operation. The priorities for weather equipment are listed in **Table 5.2** below (priorities may be adjusted based on forecasted weather). Note: If any sensor necessary to report ceilings, visibility, winds, altimeter setting, and/or discontinuity group sensor is inoperable, report outage as significant.

Table 5.2. Equipment Restoral Priorities.

Equipment	Organization	Response Times Significant/Minimal
PMSV Radio	60 CS/SCOT	Immediate/24 hours
FMQ-19	60 OSS/OSAM	Immediate/24 hours
LAN/Internet Connectivity/Phones/Hotlines/JET	60 CS/SCOI	Immediate/12 hours

5.5. Building Power. In the event of a commercial power interruption, Bldg 4 automatically switches to generator backup power.

JOHN M. KLEIN, JR., Colonel, USAF
Commander

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

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Prescribed Forms

AF Form 847, *Recommendation for Change of Publication*

Adopted Forms

DD Form 175-1, *Flight Weather Briefing*

Abbreviations and Acronyms

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFB—Air Force Base
AFPD—Air Force Policy Directive
AFFSA—Air Force Flight Standards Agency
AGL—Above Ground Level
AOL—Alternate Operating Location
AMC—Air Mobility Command
AMOS—Automated Observing System
AMW—Air Mobility Wing
ARS—Air Refueling Squadron
AS—Airlift Squadron
ATC—Air Traffic Control
CAT—Crisis Action Team
CB—Cumulonimbus
CBRNE—Chemical, Biological, Radiological, Nuclear, and High-yield Explosive
CC—Commander
CES—Civil Engineering Squadron
CONUS—**CP**—Command Post
CRW—Contingency Response Wing
CS—Communications Squadron
CWW—Cooperative Weather Watch
EM—Emergency Management
EWO—Emergency War Orders
FLIP—Flight Information Publication
FTU—Formal Training Unit
GDSS—Global Decision Support System
HF—High Frequency
IAW—In Accordance With
ICAO—International Civil Aviation Organization
ICC—Installation Control Center
IFM—Integrated Flight Management
IRC—Instrument Refresher Course
JET—Joint Environmental Toolkit

KT—Knots
LAN—Local Area Network
METAR—Meteorological Terminal Aviation Routine Report
METSAT—Meteorological Satellite
METWATCH—Meteorological Watch
MOV—Moving
MOVD—Moved
MWP—Mission Weather Product
NOTAM—Notice to Airmen
NWS—National Weather Service
OG—Operations Group
OHD—Overhead
OL-D—Operating Location-D
PAOPR—Office of Primary Responsibility
ORM—Operational Risk Management
OSAA—Airfield Management
OSAB—Air Traffic Control
OSAM—Airfield Systems
OSS—Operations Support Squadron
OWS—Operational Weather Squadron
PA—Pressure Altitude
PIREP—Pilot Report
PK WND—Peak Wind
PMSV—Pilot-to-Metro Service
RDS—Records Disposition Schedule
RP—Resource Protection
RVR—Runway Visual Range
RWY—Runway
SE—Safety Office
SFS—Security Forces Squadron
SM—Statute Mile
SOF—Supervisor of Flying

SOP—Standard Operating Procedure
SPECI—Special Weather Observation
SWAP—Severe Weather Action Plan
SWS—Special Weather Statement
TACC—Tanker Airlift Control Center
TAF—Terminal Aerodrome Forecast
TCU—Towering Cumulus
TWR—Tower
UFN—Until Further Notice
UHF—Ultra High Frequency
UNKN—Unknown
VFR—Visual Flight Rules
VHF—Very High Frequency
VIS—Visibility
WF—Weather Flight
WSHFT—Wind Shift
WSR-88D—Weather Surveillance Radar, 1988 Doppler
WWA(s)—Warnings, Watches, and Advisories

Attachment 2

SPECIAL WEATHER OBSERVATION CRITERIA

A2.1. SPECIs are taken and disseminated for listed criteria:

A2.1.1. Visibility. When the prevailing visibility decreases below or, if below, increases to equal or exceeds any of the values listed below:

Table A2.1. Visibility Levels.

Visibility (Statue Miles)	<u>3</u>	<u>2 1/4</u>	<u>2</u>	<u>1 7/8</u>	<u>1 3/4</u>	<u>1 5/8</u>	1 1/2	<u>1 3/8</u>	<u>1 1/4</u>	<u>1</u>	<u>7/8</u>	<u>3/4</u>	<u>1/2</u>	<u>3/8</u>	1/4
	Note: Items in bold/underline indicate criteria found in the high and low altitude FLIPs.														

A2.1.2. Ceiling. When the ceiling goes below or, if below, increases to equal or exceeds any of the values listed below:

Table A2.2. Ceiling Levels.

Height (feet)	3,000	2,000	1,500	<u>1,400</u>	1,000	<u>800</u>	<u>700</u>	<u>600</u>	<u>500</u>	300	<u>200</u>	100
	Note: Items in bold/underlined indicate criteria found in the high and low altitude FLIPs											

A2.1.3. Sky Condition. A layer of clouds (does not have to be a ceiling) or obscuring phenomena aloft is observed below 1,400 feet and no layer was reported below this height in the previous METAR or SPECI.

A2.1.4. Wind.

A2.1.4.1. Shifts. A directional change of 45 degrees or more in less than 15 minutes with sustained winds of 10 knots or more throughout is considered a wind shift.

A2.1.4.2. Squall. A squall is a strong wind characterized by a sudden onset in wind speed increasing at least 16 knots and sustained at 22 knots or more for at least 1 minute.

A2.1.5. Volcanic Eruption. Eruption or volcanic ash cloud first noted.

A2.1.6. Thunderstorm.

A2.1.6.1. Begins (**Note:** A SPECI is not required to report the beginning of a new thunderstorm if one is currently reported as in progress at the airfield).

A2.1.6.2. Ends (**Note:** 15 minutes after the last occurrence of criteria for a thunderstorm; an audible sound of thunder, lightning within five (5) NM of the airfield etc.).

A2.1.7. Precipitation.

A2.1.7.1. Hail begins or ends.

A2.1.7.2. Freezing precipitation begins, ends, or changes intensity.

A2.1.7.3. Ice pellets begin, end, or change in intensity.

A2.1.7.4. Any other type of precipitation begins or ends. Note: Except for freezing rain, freezing drizzle, hail, and ice pellets, a SPECI is not required for changes in type (e.g., drizzle changing to snow grains) or the beginning or ending of one type while another is in progress (e.g., snow changing to rain and snow).

A2.1.8. Tornado, Funnel Cloud, or Waterspout. When a tornado is first observed, disappears from sight, or ends.

A2.1.9. Runway Visual Range (RVR). WF provides RVR output according to the specifications listed in [Table A2.3](#)

Table A2.3. RVR Reporting.

Runway Visual Range (RVR)	
- RVR for active runway decrease to less than or, if below, increase to equal or exceed:	
- 6,000 feet (P1500 meters)	- 2,000 feet (0600 meters)
- 5,500 feet (P1500 meters)	- 1,800 feet (0550 meters)
- 5,000 feet (1500 meters)	- 1,600 feet (400 meters)
- 4,500 feet (1400 meters)	- 1,200 feet (0350 meters)
- 4,000 feet (1200 meters)	- 1,000 feet (320 meters)
- 2,400 feet (0750 meters)	- 600 feet (200 meters)
- Items in bold indicate criteria found in the high and low altitude FLIPs. - All published RVR minima applicable to the runway in use.	
- RVR is first determined as unavailable (RVRNO) for the runway in use, and when it is first determined that the RVRNO report is no longer applicable, provided conditions for reporting RVR exist.	

A2.1.10. Tower Visibility. When notified by ATC that the tower prevailing visibility has decreased to less than or, if below, increased to equal or exceed 1, 2, or 3 statute miles and the tower prevailing visibility differs from the surface prevailing visibility.

A2.1.11. Upon Resumption of Observing Services. Take, disseminate, and record a SPECI within 15 minutes after returning to duty following a break in hourly coverage, if a METAR was not filed as scheduled during the 15-minute period.

A2.1.12. Aircraft Mishap. When notified of an aircraft mishap, the WF checks the latest AN/FMQ-19 observation (i.e., METAR/SPECI/OMO (one minute observation)) and performs augmentation/back-up if required. When operating in a back-up mode WF immediately takes a SPECI observation IAW AFMAN 15-111.

A2.1.13. Any other meteorological situation that, in the weather technician's opinion, is critical.

Attachment 3

FORECAST SPECIFICATION AND AMENDMENT CRITERIA

A3.1. TAFs specify the onset, duration, and intensity for the criteria listed below. TAFs are amended when forecast/observed conditions do not match conditions specified in the TAF.

A3.1.1. Ceiling and/or Visibility. Forecast to decrease to less than; if below, is forecast to increase to equal or exceed the thresholds listed in **Table A3.1**.

Table A3.1. Ceiling and Visibility Specification and Amendment Criteria

Ceiling	Visibility	Category	Reference
Ceiling and/or visibility observed or expected to decrease to less than, or if below, increase to equal or exceed.			
≥ 2,000 FT	≥ 3 SM (4,800 M)	E	AFMAN 15-129V1
< 2,000 FT but ≥ 1,000 FT	< 3 SM (4,800 M) but ≥ 2 SM (3200 M)	D	AFMAN 15-129V1
< 1,000 FT but ≥ 700 FT	< 3 SM (4,800 M) but ≥ 2 SM (3200 M)	C	AFMAN 15-129V1
< 700 FT but ≥ 200 Ft	< 2 SM (3,200 M) but ≥ 3/8 SM (0600 M)	B	AFMAN 15-129V1
< 200 FT	< 3/8 SM (600 M)	A	AFMAN 15-129V1

A3.1.2. Surface Winds.

A3.1.2.1. Wind Speed: The difference between the predominant speed and the forecast speed is ≥ 10 knots.

A3.1.2.2. Wind Gusts: The difference between the observed gusts and the forecast gusts is ≥ 10 knots.

A3.1.2.3. Wind Direction: A change in the predominant direction of > 30 degrees when the wind speed or gusts are forecast to be ≥ 15 knots.

A3.1.3. Icing. Not associated with thunderstorms, from the surface to 10,000 ft Above Ground Level (AGL).

A3.1.3.1. When the beginning of icing first meets or exceeds the moderate or greater threshold and was not specified in the forecast.

A3.1.3.2. When icing decreases to less than the moderate threshold and was not specified in the forecast.

A3.1.4. Turbulence. For turbulence category II aircraft, not associated with thunderstorms, from the surface to 10,000ft AGL.

A3.1.4.1. When the beginning of turbulence first meets or exceeds the moderate or greater threshold and was not specified in the forecast.

A3.1.4.2. When turbulence decreases to less than the moderate threshold and was not specified in the forecast.

A3.1.5. Weather Warning and Forecast Weather Advisory Criteria.

A3.1.5.1. Occur, or are expected to occur during the forecast period, but were not specified in the forecast.

A3.1.5.2. Specified in the forecast but are no longer expected to occur during the forecast period.

A3.1.6. Altimeter setting.

A3.1.6.1. If below, increases to meet or exceed 31.00 INS and was not specified during the forecast period.

A3.1.6.2. If above, decreases to less than 31.00 INS and was not specified during the forecast period.

A3.1.6.3. If above, decreases to less than 28.00 INS and was not specified during the forecast period.

A3.1.6.4. If below, increases to equal or exceed 28.00 INS and was not specified during the forecast period.

A3.1.7. Thunderstorms.

A3.1.7.1. If the start time is incorrectly forecast.

A3.1.7.2. If the end time was incorrectly forecast.

A3.1.8. Temporary Conditions.

A3.1.8.1. Conditions specified as temporary become predominant.

A3.1.8.2. Conditions specified as temporary do not occur during the cardinal hour as forecast.

A3.1.8.3. Conditions specified as temporary are no longer expected to occur.

A3.1.9. Predominant Conditions.

A3.1.9.1. Change in conditions occurs before the beginning of the specified period of the change and are expected to persist.

A3.1.9.2. Change in conditions does not occur within 30 minutes after the specified time.

A3.1.9.2.1. Change in conditions are no longer expected to occur.

A3.1.10. Representative Conditions. Conditions are not considered representative of existing or forecast conditions and amending the forecast improves safety, flight planning, operations efficiency, or assistance to an in-flight aircraft.

Attachment 4

SAMPLE WEATHER PRODUCT DISSEMINATION FORMAT/INTERPRETATION OBSERVATION/TAF/WWAS

Table A4.1. Sample Weather Observations.

1	2	3	4	5	6	7	8	9	10
SPECI KSUU 1506Z AUTO 17013G22KT 2 1/2 RVRNO TSRA BKN015CB OVC030 19/18									
ALSTG 29.99 RMK AO2 TS OHD MOV NE									
11	12								

Table A4.2. Body of Report - Consists of 11 Groups

Body of Report - Consists of 11 Groups		
Group	Reference	Brief Description
Type of Report	A4.1.	Indicates type of report.
Station Identifier	A4.2.	A four-character group used to identify the observing location.
Date and Time of Report	A4.3.	Date and time of the report.
Report Modifier	A4.4.	A report modifier (COR) identifying report as a correction, or AUTO indicating the weather observation is a fully automated report with no human intervention. Gusts are appended if available.
Wind	A4.5.	Indicates wind direction and speed.
Visibility	A4.6.	Provides prevailing visibility from the designated point of observation in statute miles or meters.
Runway Visual Range	A4.7.	10-minute RVR or varying RVR in hundreds of feet or meters.
Present Weather	A4.8.	Any weather occurring at the observing location, obscurations to vision, or other phenomena.
Sky Condition	A4.9.	State of the sky in terms of sky cover, layers and heights, ceilings and obscurations.
Temperature and Dew Point	A4.10.	Measure of hotness/coldness of ambient air. Dew point measures saturation point temperature.
Altimeter	A4.11.	Indicates altitude above MSL of an aircraft on the ground.
Remarks	A4.12.	Remarks generally elaborate on parameters reported in the body of the report, and are included in all METAR and SPECI observations.

A4.1. Type of Report. METAR or SPECI.

A4.2. Station identifier, also called the ICAO. This code identifies the location of the observation.

A4.3. Date and Time of Report. This is in Zulu (GMT) of the last element of the observation.

A4.4. Report Modifier. The report modifier can be either of the following two elements:

A4.4.1. COR is entered into the report modifier group when a corrected METAR or SPECI is transmitted.

A4.4.2. AUTO identifies the report as a fully automated report with no human intervention. It automatically included in reports when the weather technician signs off the AMOS indicating the observations are no longer being augmented.

A4.5. Wind. The true direction the wind is blowing from is encoded in tens of degrees using three figures. Directions less than 100 degrees are preceded with a "0." The wind speed is entered as a two or three digit group immediately following the wind direction.

A4.5.1. Gust. The wind gust is encoded in two or three digits immediately following the wind speed. The wind gust is encoded in whole knots using the units and tens digits and, if required, the hundreds digit.

A4.5.2. Variable Wind Direction (speeds 6 knots or less). Variable wind direction with wind speed 6 knots or less may be encoded as VRB in place of the direction.

A4.5.3. Variable Wind Direction (speeds greater than 6 knots). Wind direction varying 60 degrees or more with wind speed greater than 6 knots are encoded as variable. The variable wind direction group is immediately following the wind group. The directional variability is encoded in a clockwise direction. For example, if the wind is variable from 180 degrees to 240 degrees at 10 knots, it would be encoded 21010KT 180V240.

A4.5.4. Calm Wind. Calm wind is encoded as 00000KT.

A4.6. Visibility. The furthest predominant distance (at least 50% of the aerodrome) seen from the airfield reported in statute miles. The most common visibility reported is 7 miles.

A4.7. Runway Visual Range.

A4.8. Present weather. Any weather phenomenon occurring on the airfield. This is mandatory anytime the visibility is less than 7 miles. [Table A4.2](#) lists the present weather codes:

Table A4.3. Weather Phenomena Codes.

Qualifier	Weather Phenomena			
Intensity Or Proximity	Descriptor	Precipitation	Obscuration	Other
- Light	MI (Shallow)	DZ (Drizzle)	BR (Mist)	PO (Developed Dust/Sand Whirls)
Moderate	PR (Partial)	RA (Rain)	FG (Fog)	SQ (Squall)
+ Heavy	BC (Patches)	SN (Snow)	FU (Smoke)	FC (Funnel Cloud, Tornado, or Water Spout)
VC (Vicinity)	DR (Low Drifting)	SG (Snow Grains)	VA (Volcanic Ash)	SS (Sandstorm)
	BL (Blowing)	IC (Ice Crystals)	DU (Dust)	DS (Dust Storm)
	SH (Showers)	PL (Ice Pellets)	SA (Sand)	

	TS (Thunderstorms)	GR (Hail)	HZ (Haze)	
	FZ (Freezing)	GS (Small Hail or Snow Pellets)	PY (Spray)	
		UP (Unknown Precip)		

A4.9. Sky Condition and Cloud Height. Describes the amount of clouds present at the airfield and the base of each cloud deck. They fall into the following categories:

A4.9.1. SKC – Sky Clear.

A4.9.2. FEW – 1/8 to 2/8 coverage.

A4.9.3. SCT – Scattered; 3/8 to 4/8 coverage.

A4.9.4. BKN – Broken; 5/8 to 7/8 coverage.

A4.9.5. OVC – Overcast; 8/8 coverage.

A4.9.6. VV – Vertical visibility; normally used during heavy fog, indicates how far up into the fog can be seen.

A4.9.7. FEW000 – Surface-based obscuration.

A4.9.8. Cloud Height. Three-digit number provides the height of the base of the cloud in hundreds of feet (e.g., 015 equals 1,500 feet). The CB and TCU descriptors may be appended to the cloud height to indicate the cloud is a cumulonimbus or towering cumulus.

A4.10. Temperature and Dew Point (i.e., can be in degrees, either Fahrenheit or Celsius).

A4.11. Altimeter Setting. The current value aircraft altimeters must be set at to read an elevation of zero. The altimeter is measured in inches (INS) of mercury.

A4.12. Remarks. [Table A4.3](#) contains some of the most commonly seen remarks in observations:

Table A4.4. Remarks Listing.

AO2—Automated sensor indicator
CB—Cumulonimbus
DSNT—Distant
ESTMD—Estimated
FROPA—Frontal Passage
LTG—Lightning
LWR—Lower
MOV—Moving
MOVD—Moved
OHD—Overhead
PK WND—Peak Wind
PRESFR—Pressure Falling Rapidly
PRESRR—Pressure Rapidly Rising
RWY—Runway
TCU—Towering Cumulus

TWR—Tower
UNKN—Unknown
VIS—Visibility
WSHFT—Wind Shift
PA—Pressure Altitude
DA—Density Altitude

A4.13. TAF.**Table A4.5. Sample TAF.**

TAF KSUU 0313/0419 14006KT 9999 BKN040 OVC100
QNH2996INS BECMG 0318/0319 20010G15KT 9999 BKN040
620406 QNH2993INS
BECMG 0320/0321 19015G20KT 8000 -SHRA FEW025 OVC040 610406
QNH2991INS TEMPO 0323/0403 VRB10G20KT 3200 -TSRA BKN015CB BKN035
BECMG 0404/0405 21007KT 9000 -RA FEW025 BKN060 620604 QNH2992INS
BECMG 0417/0418 21012KT 9999 NSW FEW030 BKN050 620505
QNH2997INS TX12/0322Z TN03/0313Z

A4.13.1. The forecast follows the same general format as the observation with the following exceptions noted:

A4.13.1.1. Valid Date/Time. Forecasts are valid for a 30-hour period. In this example, the forecast is valid from the third at 1300Z until the fourth at 1900Z.

A4.13.1.2. BECMG – This is a code to indicate the predominant conditions are going to change to (or become) the conditions listed in the line of the forecast. The conditions are changing during the time period following the BECMG code (1800 to 1900Z in the example above).

A4.13.1.3. TEMPO – This code means the conditions listed on the line may occur for periods of less than 30 consecutive minutes (45 minutes or less for thunderstorms) anytime between the time frame following the TEMPO code (03/2300Z to 04/0300Z in this example).

A4.13.1.4. Max Temp/Min Temp. TX12 indicates a maximum temperature of 12° Celsius to occur at 22Z. TN03 indicates a minimum temperature of 03° Celsius to occur at 13Z (Note: “M” indicates a minus sign in front of the number. Example: M05 = -5° Celsius).

A4.14. Weather Warnings, Watches, and Advisories.

Table A4.6. Observed Weather Warning.

TRAVIS AFB WEATHER WARNING 05-001
VALID 17/1921Z (17/1321L) TO UFN LIGHTNING IS OBSERVED WITHIN 5NM
08/RS

1. FORECAST WEATHER WARNING.
TRAVIS AFB WEATHER WARNING 11-051
VALID 10/1500Z(10/0900L) TO 10/2200Z(10/1600L)
WINDS ASSOCIATED WITH MODERATE THUNDERSTORMS ARE FORECAST TO
BE 35-49 KNOTS AT TRAVIS AFB. MAXIMUM GUST EXPECTED: 41 KNOTS 18/JDB

2. WEATHER WATCH.
TRAVIS AFB WEATHER WATCH 05-215
VALID 15/1858Z (15/1358L) TO 15/2100Z (15/1600L)
A LIGHTNING WATCH IS NOW IN EFFECT FOR TRAVIS AFB UNTIL 1600L.
A WARNING WILL BE ISSUED LATER IF REQUIRED.
58/AW

3. OBSERVED WEATHER ADVISORY.
TRAVIS AFB WEATHER ADVISORY 09-134
VALID 08/1408Z (080908L) TO UFN
CROSSWINDS OBSERVED TO BE EQUAL TO OR GREATER THAN 27KTS
44/JP

Attachment 5

CUSTOMER RESPONSE MATRIX

Table A5.1. Customer Response Matrix

Weather Phenomena	Lead Time	Impact	Customer Action
Tornado	30 min	Personal injury/death Equipment damage	Seek shelter
Damaging Hail ($\geq 3/4''$)	1 hr	Personal injury/death Equipment damage	Seek shelter; hangar or divert aircraft
Freezing Precipitation	1 hr	Delay or cease operations	Cease flying; hangar or protect aircraft
Damaging Winds ≥ 50 knots	2 hrs	Flight hazard Equipment damage	Cease unnecessary flying; secure or hangar aircraft; secure light objects outside
Strong Winds 35-49 knots	1 ½ hrs	Flight hazard Equipment damage	Cease unnecessary flying; secure or hangar aircraft
Surface winds 25-34 knots	30 min	Delay operations	Aircraft Mx: Do not operate high reach equipment. Remove all maintenance equipment not in use from aircraft parking area. Do not change positions of cowlings. Down-jack aircraft ASAP. Retract slates/flaps. Close aircraft hangar doors.
Lightning w/in 5 NM of Travis AFB	Observed	Personal injury/death Delay operations	Cease flight-line work; clear pool/golf course
Moderate Icing below 10,000 ft AGL	Observed	Flight hazard	Cease unnecessary flying. Evaluate icing conditions.
Moderate Turbulence below 10,000 ft AGL	Observed	Flight hazard	Cease unnecessary flying. Evaluate turbulence conditions.
* Crosswinds ≥ 31 knots	Observed	Flight hazard	Cease/delay take-off for KC-10, C-17, and E-6B aircraft
Crosswinds ≥ 27 knots	Observed	Flight hazard	Cease/delay take-off for C-5 aircraft
Crosswinds ≥ 19 knots but < 27 knots (wet runway)	Observed	Flight hazard	Cease take-off/landings for KC-10, and C-5 aircraft
Crosswinds ≥ 12 knots but < 19 knots (wet)	Observed	Flight hazard	Cease take-off/landings for Navy E-6B aircraft

runway)			
Low Level Wind Shear	Observed	Delay or cease operations	Delay or cease take-off/landing evaluate shear conditions
* Note: The advisory for observed crosswinds ≥ 31 knots is specifically for KC-10 and C-17 aircraft; however, the E-6B threshold is ≥ 32 knots—an additional advisory is unnecessary.			

Attachment 6

FLYING UNITS SUPPORTED & MISSION LIMITING ENVIRONMENTAL CONDITIONS

Table A6.1. Flying Units Supported.

Organization	Mission	MWP Provider
21 AS and 301 AS (C-17)	Provides worldwide airlift for war, peacetime, and contingency operations.	TACC/XOW
22 AS and 312 AS (C-5)	Provides worldwide airlift for war, peacetime, and contingency operations.	TACC/XOW
6, 9, 70, and 79 ARS (KC-10)	Provides worldwide airlift for war, peacetime, and contingency operations.	TACC/XOW
Navy VQ-3 (E-6B)	Provides C2 for POTUS	Navy

A6.1. Mission Limiting Thresholds.

A6.1.1. Airframe-Specific Weather Limitations. [Table A6.2](#) and [Figure A6.1](#) provide the general airframe weather limitations based on AFI 11-202V3, *General Flight Rules* and the limitations from aircraft specific AFI 11-2.

Table A6.2. USAF General Flight Rules Weather Limitations.

(Ref: AFI 11-202V3)		
Weather Condition	Impact	Customer Action
Cig/Vis < 2,000 / 3	Alternate required	Add fuel to allow divert
Cig/Vis < 1,000/ 2, if MAJCOM approved	Alternate required	Add fuel to allow divert
Cig/Vis < 500 / 2	Terminal not suitable for alternate	Select another alternate

Figure A6.1. Travis AFB Airframe GO/NO-GO Thresholds.

	KC-10 (Cat III)	C-5 (Cat II)	C-17 (Cat III)	E-6B (Cat II)
TAKEOFF AND LANDING THRESHOLDS	CIG <200FT / VIS <1/2SM			
	LOW-LEVEL WIND SHEAR			
	THUNDERSTORMS			
	SEVERE TURBULENCE			
	SEVERE ICING			
	WR// 19KT X-WIND	WR// 19KT X-WIND	X-WIND 31KT (WR// OR DRY)	WR// 12KT X-WIND
	X-WIND 31KT	X-WIND 27KT		X-WIND 32KT
ENROUTE HAZARDS	SEVERE TURBULENCE			
	SEVERE ICING			
	THUNDERSTORMS			
	SCT TS	SCT TS	SCT TS	AVOID ALL TS
AR HAZARDS	TS W/IN 10NM OF FL <230, 20NM ABOVE FL230	TS W/IN 10NM OF FL <230, 20NM ABOVE FL230	TS W/IN 10NM OF FL <230, 20NM ABOVE FL230	AVOID ALL TS
	AR VIS <1NM			
	MODERATE ICING IN AR			
	MODERATE TURBULENCE IN AR (OBSERVED)			
	SEVERE TURBULENCE IN AR (FORECAST)			
VR/SR ROUTES (NO CIG/VIS LIMS FOR IR ROUTES)			CIG/VIS LTE 1500FT/3SM	
			AVOID TS BY 5NM IF OUTSIDE AIR TEMP IS ABOVE 0C AT FL. IF NOT, AVOID ALL TS	
NOTE 1: RVR LIMITS ARE FOR GENERAL INFORMATION ONLY. WF PERSONNEL DO NOT ISSUE RVR FORECAST OR MISSIONWATCH FOR RVR MINIMA				
RVR LIMITS (NO RVR RWY 21R)	21L/03R: 1000 TOUCHDOWN, 1000 ROLLOUT	21L/03R: 1000 TOUCHDOWN, 1000 ROLLOUT	21L/03R: 1200 TOUCHDOWN, 1000 ROLLOUT	21L/03R: 1000 TOUCHDOWN, 1000 ROLLOUT
	03L: 1600			

MISSION EXECUTION FORECAST EXAMPLE

Figure A7.1. Travis AFB MWP

Get Area TAFs		KSEA KSMF KNFL	SAVE AS PDF	FILE: 2014.12.10 - ENRSTC24287 - CRCCI 24	
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TAFB MISSION EXECUTION FORECAST

DATE [1]	ISSUED:	CALLSIGN	BRIEFED:	UPDATED:
000000	1130Z JBB	GUCCI 24	1250Z JBB	

LOCAL TAKEOFF / LANDING FORECAST (Travis AFB)

TIME [1]	TIME [2]	CIG	VIS	WX	WINDS [H]	TWRD	TEMP F	TEMP C	AISTG	PA
7:00	15:00									
8:00	16:00									
9:00	17:00									
10:00	18:00									
11:00	19:00									
12:00	20:00									
13:00	21:00									
14:00	22:00									

AIRFIELD HAZARDS	TURBULENCE*		ICING		THUNDERSTORM		KSRR WWA / REMARKS
	NONE		NONE		NONE		

RAID TIMES ARE ESTIMATES. CHECK WITH ATIS FOR RAID DETAILS.

RASH WINDOWS:		0424L - 0 1557L -			
CLIMB WINDS (KSDU)	SFC-050		150-200		SOLAR / LUNAR (LOCAL DAY)
	050-100		200-250		
	100-150		250-300		
				MOONRI SE MOONSET X ILLUM. %	1310 SUNRISE 0724 0154 SUNSET 1657 PMSV FREQ. 271.1

ENROUTE

SEE PART II FOR AIR DETAILING / ENROUTE EVENTS

FL WINDS / TEMPS		CLOUDS AT FL	#	FL OBSCURATIONS	#	N/A
HAX CLOUD TOPS	EACH STAR	MIN CEILING		EACH STAR	MIN FREEZING LVL	EACH STAR
TURBC*	FROM DODGE EACHTOP OR	ICG	FROM DODGE EACHTOP OR	TS	DOODGE EACHTOP OR	EACHTOP OR
CRAB 25 QWS		CRAB 25 QWS		CRAB 25 QWS		

SPACE WEATHER

FREQ.	NO IMPACT	GPS	NO IMPACT	RADAR	NO IMPACT
--------------	------------------	------------	------------------	--------------	------------------

LOCAL AREA TAFS / DIVERT WEATHER

LOCAL AREA TAF RUNWAY BEARINGS LISTED AS MAGNETIC, WIND FORECAST AS TRUE DIRECTION

KSF0 SAN FRANCISCO INTL KSF0 242105Z 2424/2524 Z3040KT PESH SEC FM242100 Z3020G23KT PESH SEC FM250000 Z3040KT PESH FCW010 FM250700 Z300SKT PESH FCW010 FM251700 R100SKT PESH FCW010	KSMF CARMENTO INTERNATIONAL KSMF 241728Z 2418/2518 Z300SKT PESH SEC FM250000 R100SKT PESH SEC
---	--

KOAK METRO OAKLAND INTL KOAK 241722Z 2418/2524 Z300SKT PESH SEC FM242100 Z3040KT PESH SEC FM250000 Z300SKT PESH SEC FM250700 Y100SKT PESH SEC FM252100 S000KT PESH SEC	KNFL FALLON NAS TAF KNFL 2415/2515 Y100SKT 3300 FCW100 ONTHROINS TEMPO 2422/2504 S000KT T30/2500Z T45/2514Z P300050
--	--

PLEASE CONTACT TRAVIS WEATHER FLIGHT WITH ANY QUESTIONS AT DSM 837-3885 / COMH 787-426-3885.
IF UNABLE TO CONTACT TRAVIS WEATHER FLIGHT, CONTACT 25 QWS, BAYVIEW-MONTANA AFD AT DSM 228-3735 / COMH 838-255-3735.

CINCPAC PACFLT -- MANTLEY THREAT/CJCC --	CINCPAC PACFLT, CINCPAC -- CIVILIAN -- NOY THREAT/CJCC -- DRY RWT 12MR	CINCPAC PACFLT -- CIVILIAN -- 15R THREAT/CJCC -- 22JET DRY RWT
--	--	--

Attachment 8

SITUATIONAL AWARENESS SHEET EXAMPLE

Figure A8.1. Travis AFB SA Sheet

DATE		29-Dec-14		TRAVIS WX SITUATIONAL AWARENESS						
PROGRAMED BY:		AIR / 1400Z								
NOT A FLIGHT WEATHER BRIEF -- FOR INFORMATIONAL PURPOSES ONLY										
TIME (L)	TIME (Z)	CHG	VIS	WEATHER	WINDS (MAG)	X-WIND	TEMP C	TEMP F	ALSTG	PA
7:00	16:00	007	7	DZ	0000	0	5	41	30.21	-213
8:00	16:00	007	7	DZ	0000	0	5	41	30.21	-213
9:00	17:00	007	7	NONE	0000	0	6	43	30.22	-223
10:00	18:00	NONE	7	NONE	0000	0	8	46	30.21	-213
11:00	19:00	NONE	7	NONE	0000	0	9	48	30.19	-195
12:00	20:00	NONE	7	NONE	0000	0	10	50	30.17	-176
13:00	21:00	NONE	7	NONE	0000	0	11	52	30.14	-147
14:00	22:00	NONE	7	NONE	0000	0	11	52	30.12	-128
15:00	23:00	NONE	7	NONE	0000	0	12	54	30.10	-109
16:00	0:00	NONE	7	NONE	0000	0	11	52	30.09	-99
17:00	1:00	NONE	7	NONE	0000	0	10	50	30.09	-99
18:00	2:00	000	7	NONE	0000	0	9	48	30.09	-99
AIRFIELD HAZARDS		TURBULENCE		ICING		THUNDERSTORMS		KSUU WWA / REMARKS		LOW CEILING
		NONE		NONE		NONE				
CLIMB WINDS	3FC-500	03006	150-200	34080	MOONRISE (L):	1231	SUNRISE (L):	0724	EXPECTED BASH WINDOWS: 0624L - 0824L / 1656L - 1756L * TIMES ARE ESTIMATED. CHECK WITH AFB OPS FOR BASH DETAILS	
	050-100	34029	200-250	34080	MOONSET (L):	0041	SUNSET (L):	1866		
	100-150	34046	250-300	34080	N. ILLUM:	68	KSUU PMSV FREQ. 271.1			
2:0000Z - LOT TURB - LOT ICING - DRY RWY CROSSWIND <1000/2 - >200/1/2 - ISOLD T-STORMS - MDT TURB - MDT ICING - <27 - >18 KT DRY RWY CROSSWIND 1200Z - LOT - FEW T-STORMS - EVR TURB - EVR ICING - <20KT DRY RWY CROSSWIND										
LOCAL AREA TAFS (COLOR CODE ONLY FOR LIMITING WEATHER)										
LOCAL AREA TAF RUNWAY HEADINGS LISTED AS MAGNETIC, WIND FORECAST AS TRUE DIRECTIONS										
SACRAMENTO INTERNATIONAL RWY: 16/34 TAF AMD KSAB 291250Z 291250Z 0000 SCT100 QNH1010NS TX 13/2012Z TNM150112Z AMD 291247 TEMPO 29132018 05M SR MPG FM291000 31000KT P6SM SBC FM200000 33010KT P6SM SCT150 BKN250										
MATHER AIRPORT RWY: 04/22 TAF AMD KMAF 291140Z 29125012 VRB00KT P6SM OVC030 TEMPO 29132018 05M SR FM291000 30000KT P6SM SBC FM200000 33010KT P6SM SCT150 BKN250										
EDWARDS AFB RWY: 06/24 TAF KEDW 29100018 28000KT 0000 SBC QNH1000NS BECMG 29192000 27010KT 0000 FEW000 QNH1000NS TEMPO 29203004 2801010KT BECMG 30043006 VRB00KT 0000 SBC QNH1000NS TX 13/2012Z TNM062910Z										
MARCH AFB RWY: 14/32 TAF KRVB 29125018 VRB00KT 0000 SBC QNH1000NS BECMG 30053006 VRB00KT 0000 SCT030 QNH1000NS TEMPO 30193018 VCSH BKN10 TX 14/2922Z TNM052913Z										
OAKLAND INTERNATIONAL RWY: 09/27 TAF KOAK 291140Z 29125018 38000KT P6SM OVC030 FM291000 VRB00KT P6SM SCT030 FM292000 28000KT P6SM FEW030 FM300400 32000KT P6SM BKN030										
MCCORD AFB RWY: 16/34 TAF AMD KTCM 29143018 35000Z00KT 0000 BKN10 BKN070 020700 010000 QNH1000NS BECMG 29212002 01010KT 0000 FEW040 QNH1000NS TX 06/3012Z TNM053012Z AMD 291404										
MOSES LAKE RWY: 14/32 & 04/22 TAF KMRW 291100Z 29125012 0401400KT P6SM BKN030 OVC080 FM291000 02000Z00KT P6SM SCT080 FM292000 01010Z04KT P6SM SBC FM300000 02010KT P6SM SBC										
* ALL TIMES ARE FORECAST FOR EASTERN STANDARD TIME. * ALL TIMES ARE FORECAST FOR EASTERN STANDARD TIME. * ALL TIMES ARE FORECAST FOR EASTERN STANDARD TIME.										
-1000/2 - >200/1/2 - ISOLD T-STORMS - MDT TURB - MDT ICING - <27 - >18 KT DRY RWY CROSSWIND -200/1/2 - FEW T-STORMS - EVR TURB - EVR ICING - <20KT DRY RWY CROSSWIND										

LOCAL OPERATIONS EXTENDED OUTLOOK EXAMPLE

FORECAST DATE		31-Dec-14		LOCAL OPS EXTENDED OUTLOOK							
FOR INFORMATIONAL PURPOSES ONLY											
TIME (L)	TIME (Z)	MIN CIG	MIN VIS	WEATHER	WINDS (MAO)	X-WIND	MAX TEMP C F		MIN ALSTO	MAX PA	
0400	1200	NONE	7	NONE	38025036	18	0	32	30.20	-204	
0800	1800	NONE	7	NONE	38025036	18	1	34	30.20	-204	
1200	2000	NONE	7	NONE	38016026	18	8	43	30.16	-168	
1600	2400	NONE	7	NONE	38012018	9	6	41	30.08	-80	
2000	0400	NONE	7	NONE	38012	6	3	37	30.06	-61	
2400	0800	NONE	7	NONE	38008	6	-1	30	30.02	-33	
AIRFIELD HAZARDS		TURBULENCE			ICING			THUNDERSTORMS			
		LOT OCNL MDT		NONE				NONE			
		SFC-180									
EXPECTED BASH WINDOWS: MORNING 0826L - 0826L EVENING 1647L - 1757L * TIMES ARE ESTIMATED; CHECK WITH AM OPS FOR BASH DETAILS											
SUNRISE:		0726		MOONRISE:		1360		% ILLUM:		77	
SUNSET:		1657		MOONSET:		0258		ALL SOLAR TIMES LOCAL DAY			
<1000/2 - LOT TURB - LOT ICING - DRY RWY CROSSWIND < 18 KTS				<1000/2 - >200/1/2 - ISOLD T-STORMS - MDT TURB - MDT ICING - <29 - >18 KT DRY RWY CROSSWIND				<200/ <1/2 - FEW T-STORMS - SVR TURB - SVR ICING - >29KT DRY RWY CROSSWIND			
AR FORECAST VALID BETWEEN FL 150-300 MSL											
AR 5		AR 6 / 256		AR 8		AR 7 / 646		AR 822		AR 9	
NONE		NONE		THUNDERSTORMS		MODERATE TURBULENCE		MODERATE TURBULENCE		NONE	
AR 841		AR 848		AR 858		AR 826					
MODERATE TURBULENCE		NONE		MODERATE TURBULENCE		MODERATE TURBULENCE					
IR / SR / VR FORECAST VALID BETWEEN FL SFC-100 MSL											
IR 207 A-J		IR 207 J-G		SR 505/501		SR 504		VR 1265/1261		VR 1267	
MODERATE TURBULENCE		MODERATE TURBULENCE		NONE		NONE		NONE		MODERATE TURBULENCE	
WEATHER SUMMARY / FORECASTER REMARKS:											
THE MAJOR CONCERN WILL BE MODERATE TURBULENCE THROUGHOUT CA AND INTO NV DUE TO STRONG DIRECTIONAL AND SPEED SHEAR IN THE JET STREAM.											
IF THIS PRODUCT ASSISTED IN MAKING CHANGES TO YOUR PLANNED MISSION (E.G. AR, IR, TO) OR YOU WOULD LIKE TO SEE ANY CHANGES TO THE FORM, PLEASE EMAIL TRAVIS WEATHER FLIGHT AT: 80cwa.caw1@us.af.mil											
ROUTE NO-GO: TROPICAL STORM - VOLCANIC ASH - THUNDERSTORM - MODERATE/SEVERE TURBULENCE - MODERATE ICING - FL VIS <1NM											

Attachment 10

TRAVIS AFB METEOROLOGICAL EQUIPMENT LOCATIONS

Figure A10.1. Travis AFB Airfield FMQ-19 Sensor Groups

